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Hospitalizations Among Homeless Women: Are There Ethnic and Drug Abuse Disparities?

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Abstract

This paper explores associations among the vulnerabilities of being female, being a member of a minority group, and being a drug abuser in homeless women's hospitalizations. It uses a 1997 probability survey of 974 homeless females age 15–44 in Los Angeles. In unadjusted analyses, whites were more likely than other ethnic minority groups to be hospitalized, and drug abusers were more likely to be hospitalized than non-drug abusers. Multiple logistic regression analyses indicated that factors associated with hospitalization differed considerably among the ethnic and drug-abuse subgroups. For example, ethnic disparities in inpatient health care were found for drug-abusing women, but not for those who did not abuse drugs. Pregnancy was the only important determinant of hospitalization in all subgroups (OR, 2.9–17.4). Preventing unintended pregnancy appears to be the most inclusive means of reducing hospitalization and attendant costs among homeless women.

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The authors dedicate this paper in memory of and with great fondness for Douglas Longshore, PhD, our co-investigator and beloved colleague, who always reminded us to search for the truth and that, rather than simply “controlling” for other variables in analyzing ethnicity, to actively use those other variables in the model to explain the effect of ethnicity. Such analyses might suggest policy levers to improve the health of at-risk populations.

Introduction

It is estimated that 3.5 million people are currently without a home.¹ However, the crisis of homelessness is much worse than that: 14% of the US population (26 million people) have been homeless at some time in their lives, and 5% (8.5 million people) have been homeless within the past 5 years.² Ethnic minorities are overrepresented among the homeless: In 1996, minorities represented 25% of the US general population, but they comprised 59% of the homeless population.¹ Further, ethnic minority women and children make up the fastest growing segments of the homeless population. Among homeless persons, 20% are single women,¹ and another 15% are single women with children. Alcohol and drug abuse and mental health problems are prevalent among the homeless, and they are the dominant focus of homeless research. More than four of five homeless persons (86%) have experienced at least one alcohol, drug, or mental health problem in their lifetime, with 57% reporting mental health problems, 62% reporting alcohol problems, and 58% reporting drug problems.¹ Lifetime mood and substance-use disorders have increased among homeless women since the 1980s.³

Homeless persons have high rates of hospitalization: Almost one quarter are hospitalized every year.⁴ Homeless adults also have long hospital stays.^{5–7} A study conducted in Hawaii for the period 1988–1990 found that homeless persons' age- and sex-adjusted acute care hospitalization rate was 542/1,000 person-years, as compared with the general population rate of 96/1,000 person-years. Further, homeless adults in the Hawaiian study had an average length of stay of 10.1 days compared to a state average of 7.9 days.⁸ A study in New York found that homeless adult patients' hospital lengths of stay exceeded the mean general admission by 36%. Additionally, about three quarters of the hospitalizations were for conditions for which hospitalization is often preventable (substance abuse, mental illness, respiratory disorders, skin disorders, and most infectious diseases).⁹ Another study found that 40% of homeless adults who had been discharged were readmitted to the hospital within 14 months, usually with the original diagnosis.¹⁰

Despite higher hospitalization rates and greater disease prevalence, homeless adults are less likely to use ambulatory services than the general population. Homeless adults have a lower number of ambulatory physician contacts in the past year (2.9) than those at the poverty level (6.3) and those in the general population (5.5).¹¹ Thus, homeless persons may not receive medical care early enough to prevent more severe illness, leading to hospitalization. In this paper, we seek to understand factors that impact hospitalizations among homeless persons by exploring associations among the vulnerabilities of being female, being a member of a minority group, and being a drug abuser in homeless women's hospitalizations.

For persons aged 15–44 in the general population, female hospitalization rates (182.3 per 1,000 persons per year) exceed those for males (80.4 per 1,000 persons per year). Part of the excess comes from obstetrical admissions, but even excluding those admissions, the female hospitalization rate (118.3 per 1,000 persons per year) is higher.¹² Although male and female hospitalization rates did not differ significantly for men and women in a national sample of homeless persons who used service sites when relevant factors were controlled,⁴ homeless women of reproductive age may still have greater need for inpatient care than their male counterparts. Thus, it is important to examine correlates of hospitalization among homeless women.

Hospitalization rates in the general population also vary with ethnicity and drug use. While general hospitalization rates for ethnic minority members have traditionally been lower than those for whites, by 1981, the hospitalization rate for whites was exceeded by the rate for African Americans, and by 1997, the rate for Latinos was comparable to the white rate.¹³

Similarly, inpatient hospital utilization in the general population is higher for drug abusers than for non-drug abusers.¹⁴

In a prior analysis of the sample of homeless women used in this study, Lim et al. found that a high proportion (30%) had been hospitalized in the past year (excluding admissions for delivery).¹⁵ However, the associations of the potential vulnerabilities of being female, a substance abuser, and a member of an ethnic minority group in homeless women's risk for hospitalization for any reason were not addressed in that study, and they have not been reported elsewhere in the literature. The current study addresses this gap. It uses the Gelberg and Andersen Behavioral Model for Vulnerable Populations,¹⁶ which suggests that homeless women's hospitalization will be a function of (1) their predisposition to use or not use health services (predisposing factors), (2) enabling conditions that facilitate or impede the use of services (enabling factors), and (3) need or conditions recognized by lay people or health care providers as requiring medical treatment (need factors). Greater detail on the model is provided in a previous paper.¹⁶

Of particular interest is the hospitalization of two subgroups of homeless women at risk for inequitable care: (1) ethnic minorities—because the movement to understand and reduce health and healthcare disparities concentrates on ethnic differences, and (2) drug abusers—because they are particularly needy and face additional barriers accessing care.

Data from the Los Angeles County Homeless Women's Health Study were used. Findings from Los Angeles are particularly timely since it is one of the largest mega-cities in the world,¹⁷ and it is known as the homeless capital of the USA.^{18,19} On any given night, 80,000 persons are homeless in Los Angeles, and about one third of them are women.²⁰

This paper addresses the following questions: (1) What are the characteristics of homeless women stratified by race/ethnicity and abuse of drugs? (2) What is the prevalence of hospitalizations in the past year among homeless women as a function of race/ethnicity and drug abuse? and (3) Are other predisposing, enabling, and need characteristics associated with hospitalization in these subgroups of homeless women?

The results will clarify the extent to which hospitalization is based on demographics and need, rather than on social and enabling variables, and whether hospitalization correlates vary according to ethnicity and drug abuse. They will also suggest how existing hospital use patterns might be altered, according to the existence of mutable enabling variables in the analysis. With this information, health planners and policy makers might be able to identify homeless women who are at high risk for hospitalization and whose accessibility to more appropriate ambulatory care services should be increased, thus reducing hospitalization rates.

Methods

The UCLA Homeless Women's Health Study utilized a probability sample of 974 homeless females of reproductive age (15–44 years) who participated in a January to October 1997 survey examining their health and use of health services.²¹ All participants in the study were homeless at the time of assessment and were sampled from 66 sites (shelters and meal programs) in Los Angeles County. The focus on homeless women using shelters and meal programs was motivated primarily by cost considerations. An estimated one tenth of homeless women who never frequent free meal programs or shelters were excluded by the strategy used in this study. There is no evidence that the excluded group differed significantly from the rest according to race/ethnicity or drug use.^{22,23}

A woman was defined as homeless if she had spent any of the past 30 nights (1) in a mission, homeless shelter, or transitional shelter; a hotel paid for by a voucher; a church or chapel; an all-night theater or other indoor public place; an abandoned building; a vehicle; the street or other outdoor public place; or (2) in a rehabilitation program for homeless people; and also stayed in one of the settings mentioned in the first category. The overall response rate was 81%. More information about the design of the probability sample can be found in an article by Sumner et al.²⁴

Interviews were conducted face-to-face in areas of relative privacy within our sampling sites and lasted approximately 45 min. The Rand Survey Research Group trained the interviewers (non-medical personnel) and conducted the data collection. Extensive information about interviewer training and selection of women from each site can be found in our earlier publications.^{24,25} Briefly, the team leader randomly selected women to be screened for eligibility from bed lists, meal lines, waiting areas, or other congregating areas, and a trained interviewer then approached them to inquire about participation and to obtain oral consent. Each woman was paid \$2 for completing a screening interview that determined her eligibility and whether she had been interviewed previously. Eligible women who had not been interviewed before were paid \$10 for completing the full interview. The study was approved by the UCLA and RAND Institutional Review Boards.

Measures

The dependent variable was one or more hospital admissions in the past 12 months for physical health, prenatal care, delivery, substance abuse, or mental health. The independent variables represent various aspects of the domains of the Behavioral Model for Vulnerable Populations (Tables 1, 2, and 3).¹⁶

Predisposing domain factors consisted of the following:

- Demographics: age, race/ethnicity (categorized as white, African American, Latina, and “other”), years of education, full- or part-time work in the past 12 months, and history of having ever been in prison.
- Homeless history, measured by (1) the number of years homeless in their lifetime, (2) whether the respondents were newly homeless and had not been homeless for a year or more, and (3) the place where participants spent most of their nights in the past 30 nights, divided into five categories: (a) shelter or institution (including homeless shelter, mission, detoxification program, hotel paid for by a voucher, hospital, jail, boarding house), (b) traditional housing (including home, apartment, rental hotel, staying with relatives, staying with friends), (c) drug treatment programs, (d) limited housing (including cars, abandoned buildings, theaters), and (e) outdoor areas.
- Social contact: currently partnered, number of children, number of friends (categorized as three or more vs. fewer friends), and frequency of social contacts (measured on an ordinal scale ranging from 1, not at all, to 6, every day in the past month).
- Victimization history: physical or sexual abuse both before the age of 18 and during the past 12 months.
- Mental health: history of lifetime mental health hospitalization, recent psychological well-being,^{26,27} and depression in the past 12 months. The psychological well-being score was based on a five-item questionnaire from the MOS.²⁸ A higher score indicates better mental health; scores less than 66 suggest high risk for mental health problems and need for medical evaluation.²⁹ Depression

in the past 12 months³⁰ was measured by a screener containing two items from the Diagnostic Interview Schedule (DIS)³¹ and one item from the Center for Epidemiological Studies Depression Scale (CES-D).³² The sensitivity of the screener was 81%, and the specificity was 95% when compared against the full DIS.³⁰

- Substance use: lifetime histories of alcohol abuse/dependence (yes/no) and drug abuse/dependence (yes/no) were measured with three-item screeners developed by Rost et al.³⁰ The sensitivity and specificity of these screeners were established using data from the Epidemiological Catchment Area research program in Los Angeles County. The sensitivity of the drug screener was 91% to 92%, and the specificity exceeded 91%. The sensitivity of the alcohol screener was 91%, and the specificity was 91%.³⁰ Injection drug use in the past year was assessed by a single item.
- Sexual history: lifetime history of sexually transmitted diseases, two or more sexual partners in the past year, and sex trade during the past year.

Enabling domain factors included whether homeless women had public assistance in the past 30 days, income from family or friends in the past 30 days, health insurance, and a regular source of care.

Need domain factors included perceived general health status from the SF-36²⁸ (categorized as *fair* or *poor* vs. *better*), any bodily pain, number of serious symptoms reported in the past 12 months, based on 11 items from Andersen et al.'s list of serious symptoms for which a person should seek care (this variable was categorized as *any* vs. *none*),³³ and current and past-year pregnancy.

Analytic plan

All variables were examined with descriptive statistics. Based on its highly skewed distribution, hospitalization was dichotomized as *any* vs. *none*. Logarithmic transformations were applied to the number of years homeless and the number of children; however, the untransformed means and standard deviations are presented in Tables 1, 2, and 3. Sampling weights were used in all analyses; these weights were inversely proportional to the selection probability for each woman. Detailed information on sampling and construction of weights can be found elsewhere.²⁴ All analyses were conducted with the SAS and Stata statistical software packages. The Stata logistic regression program for survey data was used for final multivariable analyses since it accommodates sampling weights, and its estimates are corrected for intracluster correlations.

The framework for the analysis was the Behavioral Model for Vulnerable Populations;¹⁶ potential correlates of health services utilization, i.e., hospitalization in the past year, were selected if they corresponded to either predisposing, enabling, or need variables in the model. Depending on underlying distributions, chi-square, Fisher's exact, and *t* tests were used to test associations between hospitalization and the characteristics in Tables 1, 2, and 3 for the overall sample and for whites, African Americans, Latinas, drug abusers, and non-drug abusers, as defined earlier. Magnitudes of associations between these characteristics and any past-year hospitalization were examined with odds ratios (ORs) in the overall sample and in the five subsamples. We did not examine the 'other' ethnic group in detail, as it was very heterogeneous. Since many notable associations with hospitalization were found in the total sample, potential confounding was addressed by entering variables that were related to hospitalization at the 0.15 level into a stepwise backward logistic regression analysis to create a model for hospitalization. Findings were confirmed with stepwise forward analysis. The 0.10 level was used for retention in the final model. Similar regression

modeling was conducted for whites, African Americans, and Latinas, and for drug abusers and non-drug abusers. Multicollinearity was assessed and model goodness of fit was examined with the Hosmer–Lemeshow test.

As a partial test of the generalizability of this model to specific populations of homeless women in Los Angeles, a pared-down version of the model was used to assess hospitalization both in this sample and in an independent comparison sample of 1,264 homeless women in Los Angeles recruited independently by a separate study conducted in South-Central and East Los Angeles between 1994 and 1996.^{34,35} The women in that study resided in 47 traditional or sober living shelters, or were sampled through street outreach. Independent variables were necessarily limited to those collected in both studies; these included ethnicity and measures of drug abuse, as well as many covariates. The replication sample did not have several of our study's control variables including pregnancy in the past year, health insurance, and regular source of care. Nevertheless, replicating a pared-down version of the model in this comparison sample allowed us the opportunity to assess whether our study's findings regarding the effect of race/ethnicity and drug abuse could be generalized to other homeless women in Los Angeles County. Hospitalization in the past 6 months was measured in the replication sample.

Results

Sample characteristics

The total sample—The mean number of reported past-year hospitalizations was 0.63 (SD=2.5), and the range was 0–50. Thirty percent of participants had been hospitalized in the past year, and 4% reported multiple hospitalizations during this timeframe. Tables 1, 2, and 3 paint a picture of this homeless women's sample as predisposed to illness and subsequent hospitalization, limited in enabling support that would help them attain appropriate medical care, very needy, and heavy users of hospitals. Their extensive need resulted in 30% being admitted one or more times to the hospital in the past year.

Race/ethnicity and drug abuse—Tables 1, 2, and 3 also describe subsamples divided according to the race/ethnicity of the women and whether or not they were drug abusers. The demographics of the Latinas showed the most differences compared to those of the African Americans and whites. Drug and alcohol abuse were much more common for African Americans and whites than for Latinas. Sexual history also varied considerably among ethnic groups. Enabling factors were not so different by ethnic group, except that a greater percentage of both African Americans and Latinas than of whites reported a regular source of care. Needs were great for all ethnic groups. One significant difference in need factors was that a greater percentage of whites reported a serious medical symptom in the past year compared to African Americans and Latinas. Prevalence of hospital use in the past year was relatively high for whites (41%) compared to African Americans (27%) and Latinas (26%).

Differences between drug abusers and non-drug abusers were often substantial (Tables 1, 2, and 3). For example, drug abuse was associated with older age, history of incarceration, longer time homeless, victimization, and involvement in the “sex trade” in the past year. Drug abusers were also more likely to have experienced a recent hospitalization.

Model components associated with hospitalization

Table 4 shows the unadjusted relationships (crude odds ratios) between the key independent variables—ethnicity and drug abuse—and hospitalization for homeless women. It shows these relationships for the total sample, as well as separately for African Americans, Latinas,

and whites, and for drug abusers and non-drug abusers. Tables 5 and 6 show adjusted relationships (adjusted odds ratios) for the total sample, as well as for the ethnic and drug-use subsamples.

Associations with hospitalization: total sample

Concerning the key independent variables, the unadjusted odds that the minority groups would be hospitalized were all less than the odds for whites, but the “other” ethnic/minority group was the only one that was significantly different from whites, as shown in Table 4. Also, the unadjusted odds that a drug abuser would be hospitalized were significantly greater than for the non-drug abuser. In the regression model for the total sample (Table 5), all of the minority groups had lower odds of being hospitalized than did whites, but the differences were not significant. The adjusted odds of drug abusers having a hospitalization compared to non-drug abusers were not significant.

Predisposing variables—Turning to the adjusted odd ratios shown in Table 5 for the other predisposing, enabling, and need variables, the predisposing odds were significantly greater that homeless women would be hospitalized if they had ever been hospitalized for a mental health problem and if they had suffered recent physical abuse; the odds were lower if they socialized more often.

Enabling variables—The adjusted odds of hospitalization were significantly greater for an important enabling variable—being insured.

Need variables—For the need variables, the adjusted odds for hospitalization were much higher for women who were pregnant in the past year and for those reporting at least one serious symptom.

Associations with hospitalization: ethnic subsamples

Table 4 (the unadjusted analysis) and Table 5 (the adjusted analysis) often show similar results for the African Americans, Latinas, and whites to the findings for the total sample. Fewer of the odds ratios for the ethnic subgroups, compared to the total sample, were significant, partly because the sizes of the samples were smaller for the ethnic subgroups. In the presentation of the results below, the differences in correlates of hospitalization among the ethnic subgroups are emphasized.

Predisposing variables—History of incarceration was of special import for the African-American population in predicting hospitalization in the last year (Table 5). Also, a history of mental health hospitalization led to an adjusted odds ratio of more than 2, although it was not significant at the conventional 0.05 level. For the Latina group, the only significant adjusted odds ratio for predisposing variables was socialization frequency, suggesting that those with more social contacts were less likely to be hospitalized. For whites, particularly important in the regression analysis were several variables with significant odds ratios, including physical abuse as an adult and living in shelters.

Enabling variables—Enabling variables that were key correlates of hospitalization in the regression analysis (Table 5) for African Americans were health insurance and having a regular source of care. For Latinas, the adjusted odds for being hospitalized were high for having insurance. No enabling variables were significant for whites.

Need variables—Past-year pregnancy was the only need variable that was significantly associated with hospitalization across ethnic groups (ORs, 3.23–17.36). Experiencing body pain was also associated with hospitalization among African Americans and Latinas, with

odds ratios of 3 or more (Table 5). No need variable other than pregnancy was particularly important in the regression analysis for whites.

Associations with hospitalization: drug abuse subsamples

In the unadjusted analysis for drug abusers (Table 4), African-American and Latina drug abusers had significantly lower odds of hospitalization than did white drug abusers. No ethnic differences were found for non-drug abusers.

Table 6 suggests major interactions between drug abuse and other potential correlates of hospitalization among homeless women. That is, the effects of other predisposing, enabling, and need variables differed considerably for drug abusers and non-drug abusers.

Predisposing variables—Like Table 4's unadjusted findings, Table 6 shows significant adjusted odds ratios for ethnic groups among drug abusers but not among non-drug abusers. The odds ratios for non-white ethnic groups suggest that minority drug abusers were less likely to be hospitalized than white drug abusers, although the findings for Latinas were not significant.

Table 6 shows significant adjusted odds ratios for drug abusers but not for non-drug abusers for two variables: adult physical abuse and frequency of social interaction. Traditional housing had a significant adjusted odds ratio only for the non-drug abusers. Another predisposing variable that had a significant adjusted odds ratio for non-drug abusers was lifetime mental health hospitalization. Although not significant at the 0.05 level, lifetime mental health hospitalization also had a reasonably large odds ratio among drug abusers.

Enabling variables—No enabling variable was significant in the regression analyses for the drug abuse subgroups.

Need variables—In Table 6, one variable, being pregnant in the last year, had significant odds ratios for both subgroups.

Summary of key findings

To summarize the primary results of this study, whites appear to be the most vulnerable racial/ethnic subgroup among the homeless women examined. Specifically, whites were most likely to report sexual abuse in childhood, physical abuse recently and in childhood, lifetime mental health hospitalization, serious medical symptoms, and lack of a regular source of care. In descriptive analyses, whites were also most likely to report recent hospitalization. African Americans were potentially at risk for poorer health outcomes due to greater participation in sex trade and low prevalence of intimate partners. However, they were less likely to inject drugs than the rest of the sample. Latinas may have been the least vulnerable since they were most likely to be newly homeless and sheltered, and least likely to report a mental health hospitalization, alcohol or drug use, a lifetime sexually transmitted disease (STD) and multiple sex partners. As a group, drug users were more likely than non-drug users to report incarceration, chronic homelessness, victimization, poor mental health, alcohol abuse, and a high-risk sexual history. Their hospitalization rate of 35% was exceeded only by whites, with 41%. Almost one third of the total sample had been hospitalized in the previous year; a salient reason for hospitalization was past-year pregnancy, which was a moderate-to-strong correlate in the total sample and in each subsample (ORs, 2.9–17.4). None of the other correlates had the same consistent relationship to hospitalization, although history of mental health hospitalization, recent physical abuse, and health insurance were all important correlates in the total sample and in

at least one subsample. Race/ethnicity and drug abuse were not associated with hospitalization in the total sample in adjusted analyses.

Replication of findings for key covariates

Past-year pregnancy, frequency of socialization, regular source of care, insurance status, and serious symptoms were not available in the dataset used for replication of findings with respect to the key independent variables in the current study. An alternative model that was developed without these covariates included ethnicity, drug abuse, age, number of children, being newly homeless, history of incarceration, mental health hospitalization, depression, unsafe sex, recent physical assault, support from friends and family, public benefits, pain, and fair/poor health.

In unadjusted analyses in the replication sample, drug abusers were again more likely than non-drug abusers to be hospitalized. Additionally, ethnicity was associated with hospitalization in the replication sample, except the key finding was that whites and African Americans were more likely than Latinas to be hospitalized. In multiple logistic regression analyses for our study sample, ethnicity and drug abuse were not significant predictors of hospitalization when the covariates listed above were controlled, although African Americans and Latinas had lower odds of being hospitalized than whites. In the regression model for the sample used for replication, African Americans and whites did not differ in terms of hospitalization, but Latinas were far less likely to be hospitalized than were whites (OR, 0.35, $p < 0.001$). As in our sample, drug abuse was not associated with hospitalization in adjusted analyses for the replication sample. Common correlates of hospitalization included number of children, physical assault, mental health hospitalization, depression, pain, and fair/poor health. Incarceration was a correlate of hospitalization in our study's sample only, while age and public benefits were correlates of hospitalization in the replication sample (data not shown).

Discussion

The homeless women in this study reported vulnerabilities across multiple domains. Many were poorly educated, unemployed, in fair or poor health, and without a regular source of care; they were also likely to report histories of alcohol abuse, drug abuse, poor mental health, victimization, sexually transmitted disease, and incarceration. Contrary to the literature on women's health in the general population,³⁶⁻⁴⁰ whites were generally needier than the minority groups in this sample. Drug users also reported higher levels of need than non-drug users. Latinas were less likely to use substances than other respondents; nevertheless, one fifth reported sexual abuse, and injection drug use was more prevalent among Latinas than African Americans.

The extensive health needs of this sample resulted in 30% being hospitalized one or more times in the past year. Thus, the rate of hospitalization in this sample was about 302 per 1,000 persons per year, which is over 1.6 times higher than the comparable rate in the general population of similarly aged women.¹² For whites and drug abusers, who had the highest hospitalization prevalence, the hospitalization rates were about twice (2.3 and 1.9 times, respectively) the corresponding general population rate.¹² Latinas and non-drug users had relatively low prevalence of hospitalization, with rates that were about 1.4 times greater than the general population rate.¹² However, while in unadjusted analyses white women were more likely to be hospitalized than African Americans and Latinas, and drug abusers were hospitalized more often than non-drug abusers, these differences were not significant in adjusted analyses taking multiple predisposing, enabling, and need factors into consideration. In this at-risk sample, need variables and predisposing factors related to need were the primary predictors of hospitalization. Having a recent pregnancy was the most

important determinant of hospitalization. Other correlates included history of mental health hospitalization, physical abuse, and experiencing serious health symptoms. Although one enabling variable, health insurance, was associated with hospitalization in the total sample and some subgroups, another enabling variable, having a regular source of care, was associated with hospitalization for African Americans, and a social predisposing variable, number of social contacts, was inversely related to hospitalization among Latinas, the effects of these factors were less consistent. The important predisposing, enabling, and need variables in understanding hospital use often differed according to ethnic and drug-use groups. We now consider some implications of these differences.

Ethnicity and hospitalization among homeless women

Predisposing variables—African-American participants with a lifetime mental health hospitalization had over twice the odds of being hospitalized in the past year as those with no history of mental health hospitalization, although this result did not quite reach statistical significance. Further, past mental health hospitalization was associated with recent hospitalization in the total sample. However, while past mental health hospitalization was most prevalent among whites, it was not associated with recent hospitalization in this group. These findings seem to suggest that mental health problems faced by homeless white women are not receiving the same attention with attendant hospitalization that is received by African Americans. It is also possible that some mental health problems of African Americans result in general hospitalizations that might be more effectively treated by other outpatient care.

Physical abuse as an adult was a strong predictor of hospitalization for whites, but not for members of minority ethnic groups. If physical abuse is associated with continuing serious problems requiring hospitalization, it appears that minority members might be underserved in this case compared to whites. It could also be that whites have greater degrees of abuse requiring hospitalization.

Having a shelter as the usual place to stay greatly reduced the odds that homeless white women would be hospitalized. This was not the case for African Americans or Latinas. It is possible that staying in a shelter, as opposed to living on the street or in some other circumstance, helped White women to avoid hospitalization for acute problems. If so, homeless white women should be encouraged to use shelters. It would also be important to find out why shelters did not seem to play the same role for African-American women, although about half stayed in shelters. A possible contributing factor to the disparate effect of shelters is that whites had more injection drug use than African Americans; hence, sheltered status may have been a marker of less serious drug use for whites. In a previous study of homeless persons, African American women were also far less likely to inject drugs than white women.⁴¹ Almost three quarters of Latinas stayed in shelters, making housing-related associations with hospitalization more difficult to identify.

Greater frequency of social interaction significantly reduced the odds that Latinas would be hospitalized, but did not seem to play the same role for African Americans and whites. The question is whether social interaction reduces the need for hospitalization among homeless Latinas because it is substantively different between Latinas and other ethnic groups. Further exploration is needed to answer this question. However, it seems reasonable at this point to suggest that efforts to promote more social interaction would probably benefit Latinas. Future research can determine whether the nature of social interaction among homeless whites and African Americans differs from that of homeless Latinas. Are Latinas more likely to receive social support from non-drug users? Is there reason to believe that programs to increase social interaction would have different effects or that they would need to be tailored differently for African-American and white homeless women? Or are all homeless

women likely to benefit from greater social interaction with non-drug abusers, as previously reported.⁴²

Enabling variables—Having health insurance was an important correlate of hospitalization for homeless Latinas (especially) and African Americans but not for white women. While insurance may facilitate hospitalization, it could also be that homeless women who are hospitalized receive assistance in obtaining health insurance. More severe drug use may also have resulted in more urgent hospitalizations among whites, regardless of their insurance status. In any case, there seems little doubt that, given the great health needs of these homeless women, promoting some kind of coverage for them would be appropriate and would promote their use of needed outpatient and inpatient healthcare services.

Reporting a regular source of care was a significant enabling correlate of hospitalization for African Americans, but not for Latinas or whites. It seems especially important to promote ways of linking African-American homeless women to a place or individual that they can consider “a medical home.” While in the short run these findings suggest this would increase hospitalization for African-American homeless women, it may be that in the longer run a medical home that stresses prevention and monitoring care would reduce traumatic and costly acute hospital episodes. Additional research is needed to understand why having a regular source of care was not associated with hospitalization for whites and Latinas, and why whites were less likely to have a regular source of care.

Need variables—Pregnancy in the past year was a strong predictor of hospitalization in the regression analyses for all ethnic groups. The odds of hospitalization for white women who had been pregnant were particularly large compared to white women who had not been pregnant. Assuming that a hospitalization is appropriate for almost every pregnancy, increased effort should be made to ensure that homeless minority women who are pregnant receive hospital care. Another study conducted with these women found that 73% of the pregnancies were unintended.⁴³ Greater attention to family planning services might dramatically reduce homeless women’s need for hospitalization.

Experiencing body pain was a significant predictor of hospitalization for both African Americans and Latinas, but not for whites. This finding seems in line with the general literature on health disparities and delaying care. Perhaps African American and other minority women focus more on pain than on serious symptoms, such that having medical symptoms is not enough to influence them to seek care. The experience of pain, or what is reported as pain, may also differ by ethnicity. It is also possible that similar pain actually leads to differential hospitalization rates. It may be, for example, that it takes a higher level of pain to be admitted for ethnic minority members, while both high and low levels of pain lead to admissions for whites. Such an explanation would be one way to account for the significant findings for minority members but not for whites. In addition, altered pain perception resulting from use of drugs and alcohol needs to be investigated in homeless women.

Besides differential experience of pain, there are other possible explanations for the varying associations of pain and serious symptoms with hospitalization for the different ethnic groups. There may be an issue with care providers exhibiting differential referral/admitting behavior. Minorities may also delay help seeking because of perceived discrimination or racism. Further, the findings show that African Americans were highest in STDs and past-year sex trade behavior. Given the stigma associated with these factors, it is also possible that African Americans in general, and those who abuse drugs in particular, would choose not to get services unless painful conditions forced them to do so.^{36,37,39,40}

Drug abuse and hospitalization among homeless women

Predisposing variables—Among drug abusers, African Americans and members of other ethnicities had significantly lower odds of being hospitalized than did whites in the regression model. Among non-drug abusers, the odds ratios were not significantly different for any minority groups compared to whites. More studies examining the ethnic differences in hospitalization among drug users are needed. Factors that were not measured in this study, including type, mode, and conditions of drug use, with their concomitant risk behaviors and health consequences, may account for the ethnic difference found here. In a study of homeless persons exposed to hepatitis C in downtown Los Angeles, 18- to 40-year-old whites were far more likely than similarly aged African Americans to have a history of injection drug use (55% vs. 5%, respectively) and methamphetamine use (69% vs. 11%, respectively).¹⁸ However, until further research has been conducted, it seems that more attention should be paid to African-American drug users and drug users of other ethnicities who may be in need of hospitalizations they are not receiving.

Among other predisposing variables, lifetime mental health hospitalization was a significant correlate of recent hospitalization in regression analyses for both drug abusers and non-drug abusers, and for the replication sample. Since lifetime mental health hospitalization could be thought of as an (imperfect) marker of serious mental health problems, these findings are encouraging given a general definition of an equitable system as being one in which predisposing variables that are associated with health needs should predict use of health services.

Physical abuse as an adult was significantly associated with hospitalization for drug abusers but not for non-drug abusers. Victimization may be more severe for drug abusers, leading appropriately to more hospitalization than for non-drug abusers. Or, it may be that drug abusers are more likely to be in settings where the effects of abuse are more readily detected, leading to hospitalization. There is a question as to whether the treatment of physical abuse might often be something other than hospitalization. For example, if drug abusers do seek medical care, physical abuse might be detected and/or prevented at an earlier stage and treated in an ambulatory setting. Once again, physical abuse, whether reported or not, may underlie many hospitalizations.

Frequency of social interaction was significantly related to hospitalization for drug abusers, but not for non-drug abusers. Drug abusers with more social interaction had lower odds of being hospitalized than those with less. It appears that efforts to promote social interaction for homeless drug abusers might be beneficial in multiple ways, including a possible reduction in hospitalization. As noted previously, however, social interaction could also be harmful for drug abusers, particularly if the social support is from drug-abusing friends who act as barriers to hospitalization. Thus, efforts to promote greater social interaction need to include avenues to social support from non-drug using friends and family.

Enabling variables—Having health insurance was significantly related to hospitalization in unadjusted analyses for both drug abusers and non-drug abusers, but no significant associations were found in adjusted analyses. Nevertheless, health insurance was significant in the total sample model. These findings imply that health insurance is probably required to meet minimal hospitalization needs.

Need variables—Having had a pregnancy in the past year was a significant predictor of hospitalization in the regression analyses for both drug abusers and non-drug abusers. The odds of hospitalization among the non-drug abusers with a pregnancy were especially large relative to the women who were not pregnant. Pregnancy did not have as great an impact among drug abusers. It may be that some pregnant drug abusers try to avoid hospitalization

due to fear that they will lose custody of their children, resulting in the lower odds ratio.⁴⁴ Drug abuse in pregnancy is viewed as either a public health problem or deviant behavior requiring judicial intervention.⁴⁵

Limitations

Since this study has a cross-sectional, non-experimental design, it cannot be asserted with any certainty that the independent variables of the vulnerable population model are causal determinants of hospital utilization. However, a comprehensive, extensively used model of health services utilization with logical and empirically verified expectations of how the independent variables might affect health services use has been employed.

This study's data, including hospital admissions within the past year, come from self-reports of homeless women. Ideally, some of the measures would have been validated using other sources, such as examinations or medical records. However, many of the measures used in the study have been validated in other studies and are useful for self-report.²³ It is known that homeless populations can do a reasonable job of reporting outpatient health care utilization that has taken place in the past year and that hospitalization in this sample is unlikely to be discretionary.⁴⁶ Further, earlier studies comparing respondent recall of past-year hospital admissions with hospital records in a national health survey suggested respondents are accurate enough for overall past-year hospitalization. Eighty-eight percent accurately reported their hospital admissions. Inaccurate reporting included both under-reporting (5%) and over-reporting (7%). The reporting accuracy of some vulnerable groups in the national survey was lower than that for the population as a whole (poor—80% and nonwhite—83%), but still, we judge it to be at an acceptable level for the type of analysis undertaken in this paper.⁴⁷ It would have been helpful to have reasons for hospitalization or admitting diagnoses other than presumed delivery. Such information would have allowed us to specify which hospitalizations might be classified as “preventable hospitalizations.”

Similarly, more detailed information about drug use, sources of social support and timing and nature of mental health hospitalization would help clarify the study findings.

While the aims of this paper could only be addressed with this first and only large probability survey of homeless women conducted in Los Angeles, the data used are somewhat dated. It is possible that some conditions of homelessness or determinants of hospitalization have changed since the data were collected. Future studies can examine how changes in the delivery of health services, specifically access to hospitalization among homeless and uninsured populations, may differ since the original study was conducted.

Since this study of homeless women was conducted in Los Angeles County, it is uncertain to what extent the findings can be generalized to other areas. Further, since the sample did not include the small proportion (10%) of homeless women who do not use shelters and meal programs, it is unclear whether the findings can be generalized to this small but especially needy proportion of homeless women. Still, this study is of special import for the general literature on women who are homeless because it is one of the very few studies of this population to be based on a careful probability sample and that increases its generalizability. And Los Angeles represents a significant part of the national homeless population.¹⁸

Implications for Addictions Health Services

Our findings suggest that the high rate of hospitalizations among homeless women might be reduced by providing them with (1) increased availability, accessibility, and appropriateness of family planning services to help them avoid unintended pregnancies and subsequent

hospitalizations; 2) increased availability of mental health care (especially for African American women and drug-abusing women); (3) linkages to a medical home; (4) shelter, meal program, and clinic staff identification of women at risk for physical abuse and programs to prevent and address such abuse (especially for white women and drug-abusing women); (5) linkages that promote more positive social interaction, which would probably benefit Latinas and drug-abusing homeless women especially; and (6) health insurance to facilitate equity in health services distribution. Increased understanding of the role that shelters could play in reducing the risk of hospitalization may be particularly timely.

Although minority women in the general population appear to experience more health disparities, substance use, and violence, often leading to hospitalization,^{36–39} than white women, this study suggests that homeless white women differ greatly from their housed counterparts and that they may be more vulnerable than homeless minority women in some respects. Thus, increased services are needed for all homeless women, regardless of ethnicity.

Recent pregnancy was the only consistent predictor of hospitalization among ethnic and drug-abuse subgroups of homeless women. Most of the pregnancies in this sample were unintended; therefore, the most direct way to reduce hospitalization among homeless women is to provide family planning services and more contraceptive alternatives. However, current health policy fails to empower women as it does not allocate adequate funds for gender-appropriate services and health advice.⁴⁸ Additionally, more research is needed to understand the role that pregnancy might play in the lives of homeless women. Previous studies have shown that African-American homeless women particularly have a high risk of premature birth, with consequences that include extremely high costs for newborn intensive care services. Prenatal care for drug-using women is especially critical.²⁵

Victimization was also an important factor associated with hospitalization in most of the subgroup analyses in the current study and in the replication analysis. Greater attention should be paid by clinicians and social service staff to identifying homeless women at risk for abuse, ideally before abuse becomes serious enough to require hospitalization. Increased provision of safe havens for such women is indicated. Women with mental health problems were particularly likely to be hospitalized among the total sample of the current study, as well as in the replication analysis. Ongoing care for their mental health conditions and their complex life problems is urgently needed. Homeless patients who present serious physical symptoms or poor physical health may need to receive more intensive care than comparable patients in the general population, as their life circumstances are unlikely to provide the proper environment to heal. Increased availability of respite care for homeless patients has been found to prevent costly hospitalizations in homeless individuals.⁴⁹ Increased clinician effort is also needed to help homeless women obtain medical coverage for which they are eligible.

Currently, Health Care for the Homeless Programs screen homeless persons for drug use and mental health problems, but many homeless patients are treated by the general safety net system, which may not routinely screen for behavioral health problems. We recommend that all primary care providers who treat low-income populations should screen for homelessness, factors linked to unintended pregnancy, mental health problems, high-risk substance use, and victimization to prevent further health problems and need for hospitalization. Further, efforts to provide comprehensive health and social services in one location are needed.

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Table 1
Sample characteristics of homeless women, by race/ethnicity and drug use: predisposing factors

Predisposing factors	Total (N=974)	Race/ethnicity			Drug abuse	
		African American (n=564)	White (n=152)	Latina (n=258)	Yes (n=448)	No (n=522)
	% or mean (SD)	% or mean (SD)	% or mean (SD)	% or mean (SD)	% or mean (SD)	% or mean (SD)
Demographics						
Age	32.9 (7.5)	33.7 (7.1)	32.8 (7.1)	29.0 (7.6)	34.2 (6.7)	31.7 (7.9)
Race/ethnicity						
White	16.3	-	-	-	19.8	12.9
African American	55.4	-	-	-	58.4	52.6
Latina	14.1	-	-	-	10.4	17.4
Other	14.3	-	-	-	11.4	17.0
Education	11.7 (2.3)	11.8 (1.9)	12.0 (2.4)	10.6 (2.7)	11.6 (2.0)	11.8 (2.5)
Working, full- or part-time	13.2	13.5	12.5	12.0	11.5	14.6
Incarceration, lifetime	51.2	55.1	48.3	34.4	75.7	28.7***
Homeless history						
Years homeless, lifetime	2.7 (3.9)	2.6 (3.7)	3.4 (5.2)	1.9 (3.1)	4.1 (4.5)	1.4 (2.6)
Newly homeless (first homeless episode and homeless <12 months, lifetime)	37.3	34.6	42.1	51.1***	22.9	50.8***
Usual place to stay, past 30 nights						
Shelter	56.1	53.2	57.3	72.9	41.4	70.1
Traditional Housing	14.0	12.7	14.6	12.7	14.8	13.5
Drug treatment program	12.3	17.2	10.9	5.5	22.8	3.0
Limited housing	5.0	3.5	2.3	5.2	7.6	2.8
Outdoor areas	12.5	13.5	15.0	3.7	13.4	10.7
Social contacts						
Living with partner	19.4	13.4	28.7	23.1***	22.9	16.2**
No. of living children	2.1 (1.9)	2.3 (1.9)	1.6 (1.8)	2.3 (1.9)	2.2 (1.9)	2.1 (1.9)
No. of friends (two or more)	47.6	50.3	42.4	41.5	51.9	43.5**

	Race/ethnicity						Drug abuse	
	Total (N=974)	African American (n=564)	White (n=152)	Latina (n=258)	Yes (n=448)	No (n=522)		
		% or mean (SD)	% or mean (SD)	% or mean (SD)	% or mean (SD)	% or mean (SD)		
Predisposing factors								
Socialization frequency	3.2 (1.8)	3.3	2.9	3.03	3.3	3.0*		
Victimization history								
Physically abused, <18 years old	44.2	34.6	60.3	44.0***	58.0	31.5***		
Sexually abused, <18 years old	32.0	25.6	45.8	18.7***	41.8	23.1***		
Physically abused, past 12 months	34.0	31.7	36.6	26.6***	46.9	22.3***		
Sexually abused, past 12 months	12.5	9.8	9.6	19.7***	16.5	8.9***		
Mental health								
Mental health hospitalization, ever	23.5	23.2	30.5	14.3**	29.2	18.7***		
Psychological well-being, past month	63.2 (23.4)	65.9 (22.8)	56.7 (25.9)	62.6 (21.0)	59.7 (24.0)	66.5 (22.5)		
Self-esteem	3.8 (1.0)	3.9 (0.9)	3.4 (1.1)	3.5 (1.1)	3.7 (1.0)	3.8 (1.0)		
Depression, past year	48.6	48.9	53.7	47.8	58.1	40.7***		
Substance use								
Alcohol abuse/dependence, lifetime	39.5	42.6	40.8	20.0***	63.8	16.9***		
Drug abuse/dependence, lifetime	47.9	50.5	58.4	35.3***	-	-		
Injection drug use, past year	7.9	5.3	14.3	12.1***	16.5	0.1***		
Sexual history								
Sexually transmitted disease, lifetime	42.4	52.5	36.3	21.0***	59.8	26.9***		
Multiple sex partners, past year	46.4	49.1	47.7	31.8**	63.5	28.7**		
Sex trade, past year	22.1	27.9	12.6	13.2***	42.1	3.9***		

All N's are unweighted, and all statistics are weighted.

* $p < 0.05$

** $p < 0.01$

*** $p < 0.001$

Table 2

Sample characteristics of homeless women, by race/ethnicity and drug use: enabling factors

	Race/ethnicity				Drug abuse	
	Total	African American	White	Latina	Yes	No
Enabling factors	N=974, %	n=564, %	n=152, %	n=258, %	n=448, %	n=522, %
Public assistance, past year	65.5	66.3	69.2	60.8	65.5	66.4
Income from friends/family, past 30 days	35.1	35.8	34.7	28.9	44.6	26.2*
Health insurance, past year	53.6	57.0	52.1	55.3	45.8	60.6*
Regular source of medical care	60.6	69.4	51.5	70.6*	62.4	59.3

All N's are unweighted, and all statistics are weighted

* $p < 0.001$

Table 3

Sample characteristics of homeless women, by race/ethnicity and drug use: need and utilization factors

	Race/ethnicity				Drug abuse	
	Total	African American	White	Latina	Yes	No
Need and utilization factors	N=974, %	n=564, %	n=152, %	n=258, %	n=448, %	n=522, %
Need factors						
General health status, fair or poor	38.8	35.1	36.9	44.7	45.1	33.1**
Bodily pain	45.2	41.9	49.8	36.3	47.5	42.8
Serious medical symptom, past year	74.8	71.3	85.6	73.6*	77.6	72.1
Pregnant, past year	25.2	22.5	25.0	32.1	22.5	27.9
Pregnant, currently	7.8	6.9	8.2	10.4	6.1	9.4
Utilization factors						
Hospitalized, past year	30.2	27.4	41.4	26.1*	35.3	25.6**

All N's are unweighted, and all statistics are weighted.

* $p < 0.01$

** $p < 0.001$

Table 4

Unadjusted odds ratios for hospital use during the past year among the total sample of homeless women and stratified by race/ethnicity and drug abuse/dependence

Characteristics	Total		Race/ethnicity				Drug abuse/dependence					
	N=974		African American		White		Latina		Yes		No	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Race/ethnicity												
White	1.00	-	-	-	-	-	-	-	1.00	-	1.00	-
African American	0.71	0.48, 1.03	-	-	-	-	-	-	0.38	0.23, 0.62**	0.92	0.51, 1.65
Latina	0.70	0.43, 1.14	-	-	-	-	-	-	0.44	0.21, 0.94*	0.76	0.37, 1.55
Other	0.57	0.33, 0.98*	-	-	-	-	-	-	1.01	0.51, 2.02	0.65	0.31, 1.35
Drug abuse/dependence, lifetime	1.58	1.20, 2.09*	1.03	.71, 1.50	2.53	1.27, 5.02	1.49	.69, 3.18	-	-	-	-

En dash variable not used in the model

* $p < 0.05$

** $p < 0.001$.

Table 5

Logistic regression models for homeless women's past-year hospitalizations, total sample and stratified by ethnicity

Variable	Total sample (N=939)		African Americans (n=549)		Whites (n=150)		Latinas (n=144)	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Predisposing factors								
Ethnicity (vs. white)								
African American	0.67	0.40, 1.12	-	-	-	-	-	-
Latina	0.53	0.27, 1.05	-	-	-	-	-	-
Other	0.74	0.26, 2.06	-	-	-	-	-	-
Prison	-	-	2.07	0.89, 4.83	-	-	-	-
Usual place to stay, past 30 nights: living in shelters	-	-	-	-	0.31	0.13, 0.77*	-	-
Living with partner	1.65	0.89, 3.04	-	-	-	-	-	-
Socialization frequency	0.86	0.74, 0.999*	-	-	-	-	0.64	0.50, 0.81***
Mental health hospitalization	1.96	1.13, 3.42*	2.30	0.98, 5.37	-	-	-	-
Physically abused, <18 years old	-	-	1.62	0.96, 2.74	-	-	-	-
Physically abused, past 12 months	1.89	1.16, 3.07*	-	-	4.04	1.24, 13.17*	-	-
Drug abuse	1.56	0.95, 2.58	0.75	0.34, 1.65	2.57	0.86, 7.69	1.04	0.35, 3.10
Enabling factors								
Health insurance, past year	2.19	1.33, 3.61***	1.93	1.09, 3.42*	-	-	5.16	2.18, 12.22***
Regular source of care	-	-	1.84	1.11, 3.06*	-	-	-	-
Need factors								
Bodily pain	-	-	3.07	1.84, 5.12**	-	-	3.11	1.31, 7.37**
Serious medical symptom, past year (any)	1.86	1.01, 3.39*	-	-	-	-	-	-
Pregnant, past year	3.75	1.83, 7.71***	4.55	2.17, 9.53***	17.36	5.91, 51.0***	3.23	1.20, 8.74*

Covariates in regression models differed by ethnicity. No statistics were reported for covariates not in the models.

En dash variable not used in the model

* $P < 0.05$

** $P < 0.01$

100.000

 $p < 0.001$

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Table 6

Logistic regression models for homeless women's past-year hospitalization, stratified by drug abuse

Variable	Drug abusers (n=454)		Non-drug abusers (n=444)	
	OR	95% CI	OR	95% CI
Predisposing factors				
Ethnicity (vs. white)				
African American	0.43	0.20, 0.95*	0.76	0.33, 1.74
Latina	0.63	0.25, 1.55	0.45	0.15, 1.30
Other	0.20	0.07, 0.60**	1.20	0.26, 5.49
Usual place to stay, past 30 nights: traditional housing	–	–	4.59	1.90, 11.06***
Physically abused, past 12 months	2.15	1.17, 3.94*	–	–
Socialization frequency	0.80	0.66, 0.98*	–	–
Mental health hospitalization, ever	1.94	0.93, 4.04	3.18	1.45, 6.97**
Enabling factors				
Health insurance, past year	–	–	2.05	0.89, 4.73
Need factors				
Pregnant, past year	2.89	1.32, 6.35**	12.0	4.95, 29.08***

Covariates in regression models differed by drug abuse. No statistics were reported for covariates not in the models.

En dash variable not used in the model*
 $p < 0.05$ **
 $p < 0.01$ ***
 $p < 0.001$.